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An empirical analysis of the projects aiming sustainable energy development (SED) in Romania

Oana-Cătălina Ţăpurică, Florin Tache *

The Bucharest University of Economic Studies, Faculty of Management, 6 Piata Romana, District 1, Bucharest Postal Code 010374, Romania

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ABSTRACT

The paper provides a comprehensive analysis of the projects aiming the use of renewable energy sources (RES) in Romania, taking into account both the convertible energy potential of this country, as well as the requirements for meeting European Union sustainable energy development targets by 2020. We analyze the current state of renewable energy production facilities in Romania, in correlation with the data collected from 89 energy projects financed through the Operational Sectoral Program *Increase of Economic Competitiveness* since 2007 until 2013, more than a half of them aiming the development of new RES energy facilities. We also analyze the data quantifying the efficiency of specific investments in renewable energy, in comparison with EU average statistical data and provide some concluding remarks about the difficulties faced by investors during project implementation, given the particularities of the country related with this field.

Contents

1. Introduction

Romania and Bulgaria are the newest member states which joined European Union in 2007. Since then, they have been expected to become part of the EU mechanism and to make their contribution in reaching the Union's strategic targets in several fields, such as infrastructure, energy development, rural development, economic competitiveness, etc. In order to support the new member states through the development process, EU has allocated for each of them a certain quota of the Structural Funds, which are regarded by [1] as European Union's main instruments for sustaining social and economic restructuring across the Union. This quota, allocated for a six year period, since 2007–2013, was expected to cover the economic gaps between new member states' economies and the average economic level across EU.

Taking into account these circumstances, our research will focus on the energy field in Romania, given its strategic importance both

Abbreviations: RES, Renewable Energy Sources; SED, Sustainable Energy Development; EU, European Union; ERDF, European Regional Development Fund; MW, Megawatt; TGC, Tradable Green Certificate; IEA, International Energy Agency; ths., thousands; RO, Romania

* Corresponding author. Tel.: +40 721600489.
E-mail address: florin.tache@yahoo.com (F. Tache).

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for the economic development of the country, as well as for the compliance with the RES policies and the strategic targets of EU regarding SED. Nowadays, Romania, like many other European countries, is facing the challenges in the energy field mentioned by [2], that include energy sustainability, the security of supply, the safety of the energy chain, and growing demand which is specific to developing countries. In this context, we assume the need of a paradigm shift in the energy field, by focusing on two main coordinates: increasing energy efficiency, and promoting RES.

2. Objective and research process

The paper aims to provide a country review focused on the reason why SED projects in Romania did not developed according to the country's renewable energy potential for each of the available RES, despite of the financial support provided by European Union through Structural Funds. We start by providing some basic information about the background of SED projects in Romania, we analyze the current state of existing projects, and afterwards we describe the main features of EU financial support for developing SED projects, in order to identify the main shortcomings faced by investors in the process of developing new renewable energy capacities.

The facts should be concludent both for assessing the efficiency of SED projects in Romania, given the EU financial support, as well as for forseeing the future trends in renewable energy within the country. We use statistical data to reveal the fact that so far neither energy efficiency, nor promotion of RES, were efficiently managed within Romania, and the easily reach of EU mandatory quota of renewable energy in overall energy consumption is only due to EU financial support and to an oversized TGC allocation scheme.

3. Analyzing SED in Romania

3.1. Background

According to [3], SED is a new paradigm within energy industry, aimed to fulfill growing energy needs, to enable access to billions of individuals without access to high-quality fuels, and to reduce greenhouse gas emissions. SED is also closely related to renewable energy, given the fact that, as [4] pointed out, a wider use of renewable energy and increase of energy efficiency can make a valuable contribution to meeting the targets of sustainable development.

In a recent study carried out within Western Balkan countries (Serbia, Croatia, Bosnia–Herzegovina, Montenegro, Albania, and Macedonia) in 2011, [5] stated that all the mentioned states have one of the highest energy intensities in Europe, as well as one of the highest potential for producing energy from renewable sources. However, [5] highlighted that very little investment and priority are being given to the increase of the energy efficiency. Although Romania was not part of the study, its renewable energy potential is even higher than the one of its south-western Balkan neighbor, Serbia, while the lack of interest in ensuring energy efficiency is quite the same.

Unlike the aforementioned countries, Romania has the advantage of being an EU member state, eligible for financial support through Structural Funds, regarded by [1] as the main financial support instrument, aiming to contribute to the economic development of disadvantaged regions.

Moreover, a study carried out in 2013 by [6], reveals that Romania has the 13th All Renewables Index (ARI) in the world (48.60), after countries like China (70.10), Germany (65.60), or Italy (52.40), but before Poland (48.10), Spain (46.20), or Netherlands (42.80), which emphasizes the huge potential of the country for generating energy from renewable sources.

Although, according to [7], Structural Funds have not been used in the best way by promoting infrastructure projects without taking into account their impact on natural resources or climate issues, in Romania this instrument is regarded as the main financial pillar for supporting both the increase of energy efficiency and the development of renewable energy production capacities. The situation is rather similar in Bulgaria, where the Rural Development Fund (RDF) and the Structural Fund “Competitiveness” include a substantial number of “priority axis” for the support of RES, but most of these were not open just two years before the end of the current EU budget [8].

Most of the energy projects in Romania (very similar with megaprojects defined by [9] as multi-billion dollar infrastructure projects, and characterized by [10] as being commissioned by governments and delivered by private enterprises) were financed, during 2007–2013 period, through Operational Sectoral Program *Increase of Economic Competitiveness,* Priority Axis 4 *Increasing Energy Efficiency and Security of Supply, in the Context of Combating Climate Change*, which is part of the European Regional Development Fund (ERDF). Since 2007, the started projects are totalizing more than 1.000 million Euros, more than half of these funds being provided through this Program, which is governed by [11].

According to [12], the majority of mega-projects overrun on costs, fall behind schedule and fail to deliver in the terms used to justify the need for the project. Morevover, according to [13] when developing SED projects investers should take into account the fact that budgets should be site and technology specific: technology costs vary with transportation distance, while interconnection, permiting and development costs vary with location. Apparently this seems to be the case of Romania, too, because the country lacks experience in dealing with SED projects.

Further, we provide a comprehensive analysis of the renewable energy sector in Romania, together with some relevant information about projects aiming the use of RES by analyzing the current state of renewable energy production capacities in Romania, in correlation with the data collected from 89 energy projects started since 2007. Also, we analyze the main difficulties in implementing SED projects and we conclude by discussing the perspectives of the SED concept in Romania.

Table 1
Renewable energy capacities in Romania in 2012.
Source: [13].

Renewable energy sources (RES)	No. of active renewable energy producers	Active installed capacity (MW)	No. of authorized but inactive renewable energy producers	Inactive installed capacity (MW)
New wind facilities	55	1.704	41	2.105
Refurbished wind facilities	14	12	0	0
New small hydropower plants (less than 10 MW)	64	98	41	95
Refurbished small hydropower plants (less than 10 MW)	48	47	14	28
Bioenergy – all types of technologies, including co-generation	7	28	9	28
Solar and photovoltaic facilities	32	41	73	371

3.2. State of the renewable energy sector in Romania

According to statistical data provided by [12], the share of electricity produced from RES in the national gross final energy consumption in Romania was 18.40% in 2007 (the first year of Romania as a EU member state), but, according to [11], this was almost entirely produced within large hydropower plants. In 2008 and 2009 the share increased by approximately 10% yearly, until 2010, when the share of electricity produced from RES was only 3.10% higher than the 2009 level. [14] identified four EU member states which had already met more than a third of their overall electricity demand by RES (Austria, Sweden, Latvia, and Romania) by the beginning of 2011.

The EU target for 2020 regarding the share of electricity produced from RES in the national gross final energy consumption is 20%, while the target of Romania is 24%, which means Romania will probably face no difficulties in fulfilling this target. Moreover, by 2015 the Romanian Government aims to increase the share of electricity produced from RES to 35%, which can be a challenging target, given the current circumstances on the market. Therewith, in order to avoid a heavy reliance on hydro energy produced in large capacities, the Romanian Government provided incentives for investing in other renewable source. Moreover, according to [15], recent success in the installation of renewable energy is largely due to public financial incentives.

In Table 1 we present the current state (registered in December 2012) of renewable energy sector in Romania, including both the operating capacities, as well as the potential ones.

Therefore, by the end of 2015, if all authorized but inactive renewable energy producers will become active, and the active renewable energy producers will not choose to leave the market, Romania will have about 398 renewable energy producers, as shown in Fig. 1.

Thus, we can provide some interesting facts, by analyzing Fig. 1 and Table 1:

- Investors have chosen to invest rather in small hydropower plants (41.96%), wind facilities (27.64%), and solar and photovoltaic facilities (26.52%) than in bioenergy and other co-generation facilities.
- The number of authorized but inactive renewable energy producers is bigger than the number of active renewable energy producers in the fields of solar energy (with 228.12%) and bioenergy (with 128.57%).
- Wind facilities are more attractive than other types of renewable energy, the inactive installed capacity is 123.53% higher than the current active installed capacity of 1.704 MW; the attractiveness of wind capacities is mostly due to three reasons, as follows:
  – The existence of more available data about wind capacities in Romania than about any.
  – The existence of several projects in the field of wind energy, which reduces uncertainty, as Romanian investors usually present risk disinclination.
  – The existence of several studies proving an increased wind potential in Romania all over the year.

Therefore, a deeper analysis reveals that none of these trends is casual, as there are two main factors influencing the investors' behavior: the incentives, and the experience.

The incentives are related to the number of tradable green certificates (TGCs) each producer is awarded for each MW of energy produced from RES. In Table 2 we outline the current situation in Romania.

Thus, each active renewable energy producer currently receives six certificates for each MW of solar energy, twice as much as a hydropower producer and three times as much as a wind energy producer. This could be a possible explanation for the appetence of Romanian investors in developing solar and photovoltaic facilities. A relative similar situation led Spain in 2012, to a complete suspension of support schemes for future RES plants, not for existing ones [18]. However, developing solar and photovoltaic facilities involves higher costs, higher risks, and a higher dependence on the climate issues, which makes this investment inappropriate for those investors who have risk disinclination, who will probably choose to invest in hydropower plants (as stated before, is the most widespread type of renewable energy in Romania), or in wind facilities. As shown, bioenergy is not a very popular investment either for active producers, or for inactive ones.

The experience is related to another important aspect regarding the trends of renewable energy sector (regarded as an efficiency index), which is the analysis of the installed capacity (either active or inactive) per producer. In four of six cases, the installed capacity per producer is higher for inactive renewable energy producers than for active renewable energy producers, as shown in Fig. 2.

Therefore, the inactive installed capacity per producer of refurbished wind facilities is the same with the current active installed capacity per producer, while the inactive installed capacity per producer of bioenergy is lower than the current active installed capacity per producer, which means forthcoming investments in bioenergy are less efficient than existing ones. Thus,

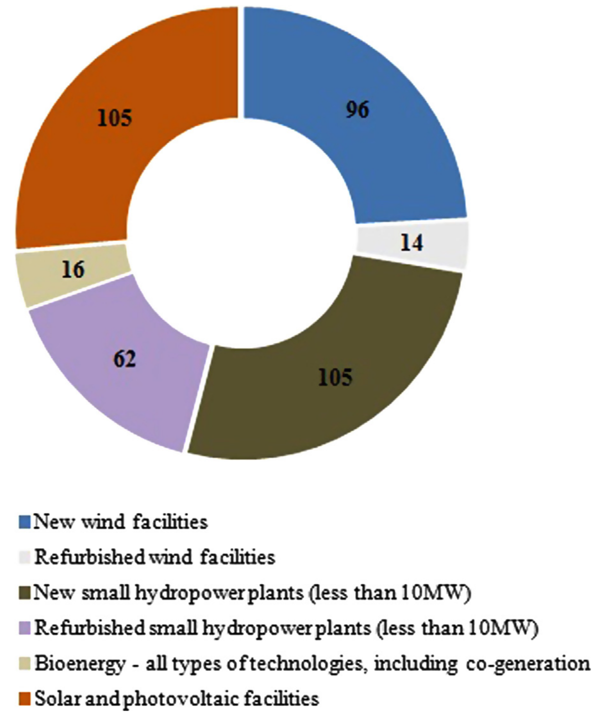


Fig. 1. Estimated number of renewable energy producers by the end of 2015. *Source*: Authors' own calculations based on [16].

Table 2
TGCs as an incentive for investors in renewable energy facilities since 2012 until present.
Source: [14].

Renewable energy sources (RES)	Number of TGCs/MW
New wind facilities	2
Refurbished wind facilities	2
New small hydropower plants (less than 10 MW)	3
Solar and photovoltaic facilities	6

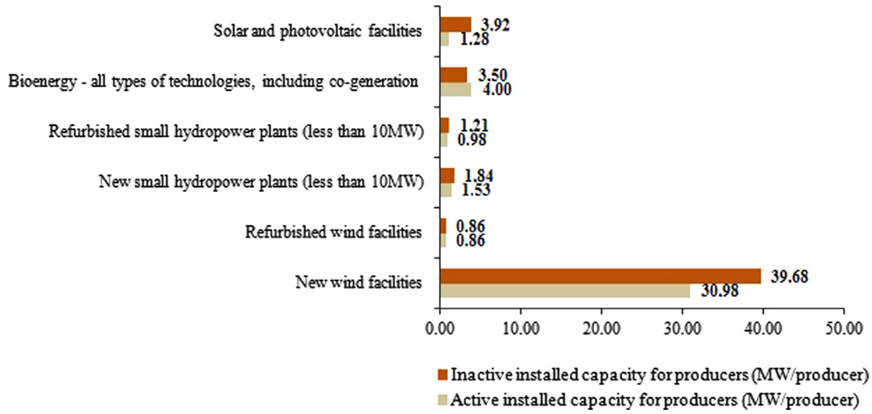


Fig. 2. Installed capacity per producer in Romania in 2012.
Source: Authors' own calculations based on [16].

Table 3
Specific investment in renewable energy facilities in Romania and EU.
Source: Authors' own calculations based on [13].

Renewable energy sources (RES)	Specific investment			Specific investment (mean variations)	
	(ths. Euro/MW) – IEA 2012	(ths. Euro/MW) – RO 2012	(ths. Euro/MW) – EU 2012	RO – EIA (%)	RO – EU (%)
New wind facilities	1.204	1.480	1.570	22.92%	−5.73%
Refurbished wind facilities	–	–	650	–	–
New small hydropower plants (less than 10 MW)	2.808	2.370	3.700	−15.60%	−35.95%
Refurbished small hydropower plants (less than 10 MW)	–	2.260	1.700	–	32.94%
Bioenergy – all types of technologies, including co-generation	3.770	3.420	4.700	−9.28%	−27.23%
Solar and photovoltaic facilities	1.916	1.870	3.500	−2.40%	−46.57%

Romania is expecting lower investments in bioenergy and cogeneration facilities, and higher investments in solar and photovoltaic facilities (the efficiency of forthcoming facilities is 3.06 times higher than the efficiency of current facilities), as well as in new wind facilities (the efficiency of forthcoming facilities is 1.28 times higher than the efficiency of current facilities).

Besides *incentives* and *experience*, there are also some macroeconomic facts that may produce a certain influence on the development of SED projects in Romania. For instance, the highlight of 2012 was a further shift in activity from developed, to developing economies. Total investment in developed economies in 2012 was down 29% at $132 billion, while that in developing economieswas up 19% at $112 billion, the highest ever [19]. However, the other major theme in 2012 worldwide was a further significant reduction in the costs of solar photovoltaic technology. The levelised cost of generating a MW h of electricity from PV was around one third lower in 2012 than the 2011 average [19].

3.3. Economic efficiency of SED investments in Romania

The literature on economic efficiency of SED investments is principally focussed upon evaluating whether policy has been economically efficient in terms of the resources expended in delivering renewable energy–whether in simple financial terms or against social costs/impacts [20].

Further, we shall compare the cost-effectiveness of SED projects in Romania with the average costs across the member states of the EU, in order to analyze whether the funds allocated to renewable energy sector were used in a more appropriate manner than in other European countries.

In Table 3 we emphasize the average specific investment in renewable energy facilities in Romania, against the same indicator within European Union and International Energy Agency (IEA), one of the most important bodies within energy industry worldwide.

We can notice there are two fields where the specific investment in Romania exceeds the reference levels: wind facilities and refurbished small hydropower plants. In terms of wind facilities, the specific investment in Romania is 5.73% lower than EU average (1.480 ths. Euros/MW in Romania in regard to 1.570 ths. Euros/MW in EU), but 22.92% higher than IEA reference level (1.480 ths. Euros/MW in Romania against 1.204 ths. Euros/MW, according to IEA). With regard to refurbished small hydropower plants, IEA has no available data, but the specific investment in Romania is much higher than the EU average (2.260 ths. Euros/MW in Romania in regard to 1.700 ths. Euros/MW in EU), which means refurbishing small hydropower plants is rather an inefficient investment than a cost-effective one. We assume the situation will be rather similar in the case of refurbished wind facilities, but the hypothesis cannot be confirmed, as there are no available data in Romania regarding this issue.

The absence of data is due to the fact that wind technologies are quite new in Romania, and they did not evolve in a manner that would request a refurbishing of existing capacities. However, the lack of experience in refurbishing wind power capacities, along with a deficient know-how transfer, empower the presumtion that the first refurbishments will be done at a higher cost that the EU average, and therefore, would be inefficient. Moreover, refurbishing wind capacities involve skilled staff, which is hardly available in countries such as Romania and Bulgaria, where renewable energy is still an emergent trend.

Taking into account that both wind facilities and hydropower plants hold together 90.73% of the active installed capacity in Romania, we may conclude that the overall investments in SED

Table 4
Capacity factor of RES in Romania.
Source: Authors' own calculations based on [13].

Renewable energy sources (RES)	Capacity factor (%) – RO 2012	Capacity factor (%) – EU 2012	Capacity factor (mean variation) RO – EU (%)
New wind facilities	25	25	0.00
Refurbished wind facilities	22	16	37.50
New small hydropower plants (less than 10 MW)	28	28	0.00
Refurbished small hydropower plants (less than 10 MW)	34	24	41.67
Bioenergy – all types of technologies, including co-generation	69	83	– 16.87
Solar and photovoltaic facilities	17	16	6.25

seem quite ineffective, and project budgets might be oversized. The analysis also reveals that specific investments in solar and photovoltaic facilities are 2.40% lower than IEA average, and 46.57% lower than EU average, which recommends Romania as a top-country in the field of solar and photovoltaic facilities.

The hypothesis is also advocated by a analysis carried out upon the capacity factor of each type of investment, as shown in Table 4.

According to the data, the capacity factor in Romania is higher than the EU average for refurbished wind facilities, for refurbished small hydropower plants, as well as for solar and photovoltaic facilities. Given the fact that investing in refurbished facilities (either wind or small hydropower ones) is not cost-effective, as shown previously, the most suitable alternative for investing remains the solar and photovoltaic facilities. On the contrary, investing in bioenergy, as a RES for producing renewable energy seems not to be the appropriate alternative for investors in Romania, as the capacity factor is 16.87% lower than the EU average.

3.4. *SED projects in Romania and the Structural Funds*

As stated before, the large investment projects in renewable energy field in Romania were triggered by the financial suport granted by the EU through ERDF within Operational Sectoral Program *Increase of Economic Competitiveness,* Priority Axis 4 – *Increasing Energy Efficiency and Security of Supply, in the Context of Combating Climate Change* [11], which cumulated more than 95% of the EU financial support allocated to Romania for restructuring energy industry and promoting RES. Analyzing the database provided by [17], since 2007, 89 projects were started in the energy industry aiming either the increase of energy efficiency or the development of renewable energy facilities.

As shown in Table 5, the total amount of money invested until April 2013 in implementing these projects exceeded 1 billion Euros, distributed unevenly between EU (through ERDF), the Romanian Government, and the public or private investors.

Public funds represented 41.94% of the overall investments in SED, which means the investors were supposed to cover more or less than 58% of the investment. Moreover, if we take into account that almost half of the investment was irredeemable, and the redemption of the second half was hastened by TGC schemes, developing SED projects proved to be a rather attractive challenge for energy investors.

The analyzed SED projects are aiming either the increase of energy efficiency, by improving existing non-renewable energy facilties, or the development of renewable energy facilities, as shown in Fig. 3.

As expected, 71.64% of the funds were aimed to develop renewable energy facilities, while 28.36% of the funds were used to improve energy efficiency. The average budget for a project aiming the development of renewable energy facilities was twice as higher as the average budget of a project aiming the improvement of energy efficiency (15.061 ths. Euros for 49 projects aiming the increase of energy efficiency, in regard to 7.305 ths. Euro for 40 projects aiming the development of renewable energy facilities).

Table 5
Sources for financing SED projects in Romania through Structural Funds since 2007 until April 2013.
Source: Authors' own calculations based on [15].

Source for financing SED projects	Amount (ths. Euro)
ERDF	380.220
Romanian Government	51.867
Public funds (total: 1+2)	**432.087**
Private subscription	330.279
Eligible expenses (total: 3+4)	**762.367**
Non-eligible expenses	267.834
Overall private subscription (total: 4+6)	**598.114**
Overall budget (total: 3+7)	**1,030.201**

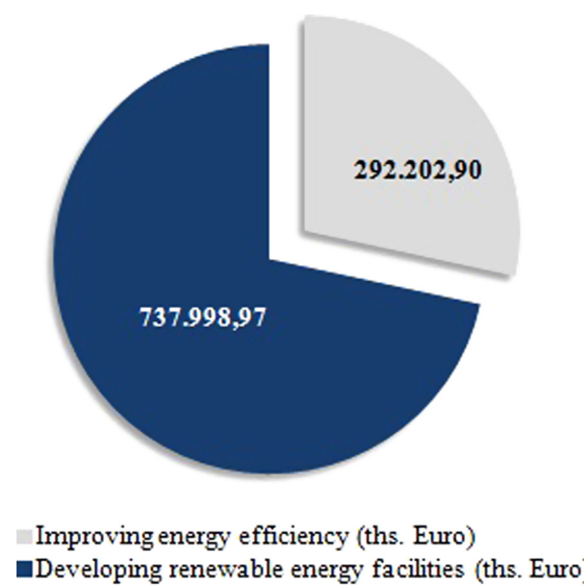


Fig. 3. Fund allocation of SED projects in Romania, by their objective since 2007 until April 2013.
Source: Authors' own calculations based on [21].

If we are analyzing only the projects aiming the development of renewable energy facilities financed through Structural Funds, we discover that most of the funds were allocated for wind capacities (39.33%) and small hydropower plants (30.83%), as shown in Fig. 4.

In Table 6 we outline the main financial parameters of SED projects financed through Operational Sectoral Program *Increase of Economic Competitiveness* in Romania.

Therefore, most of the renewable energy projects financed through Structural Funds aimed the development of small hydropower plants (17 projects), the development of new bioenergy

facilities (12 projects), and the development of new wind facilities (10 projects). In average, projects aiming the development of wind facilities involve more than twice as much financial resources as any other project.

Under these circumstances, we assume a certain correlation between the installed capacity (either active or inactive) mentioned in Table 1 and the destination of the Structural Funds aiming SED in Romania. The investors have chosen rather to invest in hydropower and wind power due to a lower degree of risk and a higher experience on the market, where already existed appropriate technologies for generating energy from these two sources. Those who have chosen to invest in bioenergy intended to achieve a competitive advantage, given the inexistence of market entry barriers and the lack of strong competition on the market.

The evidence also emphasizes some particularities of using EU Structural Funds for ensuring the SED across Romania, as follows:

- Bioenergy is not very popular among Romanian investors, despite an available energy potential, which is higher than the current investments.
- Wind power projects are usually larger than most of the SED projects both from the point of view of installed capacity (88.29% from the overall installed capacity of RES) and average budget (39.33% from the overall budget of RES financed through Structural Funds).
- Investments in solar and photovoltaic facilities, despite their aforementioned efficiency and attractiveness for investors, are not very capitalized in Romania, given also the fact that not all regions in Romania are adequate for investing in solar or photovoltaic facilities.
- Non-renewable energy is still one important pillar for supporting energy development in Romania; nevertheless, the investments in refurbishing obsolete technologies and in improving the efficiency of non-renewable sources are dropping down constantly.
- Investing in projects aiming refurbishing the existent energy facilities is less expensive than investing in new RES facilities, but existent facilities produce serious damages on the environment; many experts like [1,9] are claiming that Structural Funds have not been used in the best way, by promoting infrastructure projects without taking into account their impact on natural resources or climate issues.

Data collected reveals certain particularities of SED projects in Romania, as well as some possible trends of investments in renewable energy facilities, given both the convertible energy potential of this country, as well as the requirements for meeting EU sustainable energy development targets by 2020.

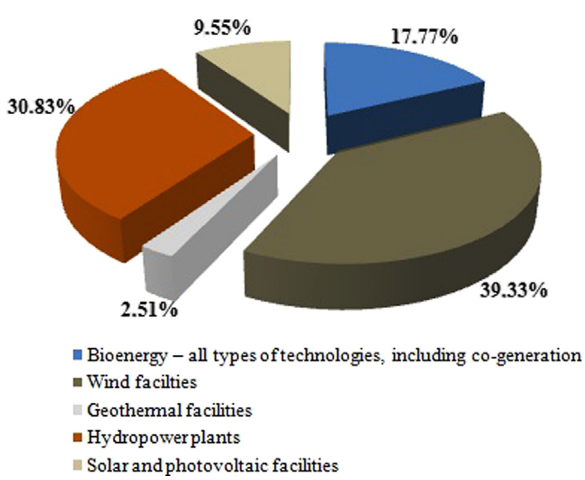


Fig. 4. Fund allocation on RES projects in Romania since 2007 until April 2013. *Source*: Authors' own calculations based on [18].

4. Difficulties faced by investors during SED projects implementation

Among the 89 aforementioned projects aiming SED in Romania, financed through Operational Sectoral Program *Increase of Economic Competitiveness* in Romania, 80 of them are still under implementation, although many of them should have been finalized so far. Analyzing the database of [22], taking into account the authors' own calculation, we can state that 93.75% of the projects under implementation (75 projects out of 80) are facing scheduling problems, while 85% of them are expected to overrun preset costs.

Apart from these problems, the investors are facing several difficulties, which hinder the efficiency of the projects and increase the risk of failure during implementation, in terms of time, costs, and targets. In Table 7 we outline the main difficulties faced by investors in energy field with regard to their projects aiming either an increase in energy efficiency or the development of new energy facilities. The sample includes all the projects (89 projects) previously mentioned aiming SED in Romania.

We assume that the most common difficulties faced by Romanian investors during SED projects' implementation are the delays in payments from public funds, and the inappropriate scheduling of activities. We may also state that the deficient scheduling of activities might be also a consequence of the lack of liquidity caused by the delays in payments from public funds.

All the projects financed through Operational Sectoral Program *Increase of Economic Competitiveness* were affected by the non-compliance of management authorities with agreed payment schedule. Moreover, most of the project aiming the development of new renewable energy facilities were endangered by the lack of

Table 6
Financial parameters of SED projects in Romania since 2007 until April 2013.
Source: Authors' own calculations based on [15].

Renewable energy sources (RES)	Overall budget (ths. Euro)	Share in overall budget (%)	Number of projects	Average budget of individual projects (ths. Euro)
Bioenergy – all types of technologies, including co-generation	131.152	12.73	12	10.929
Wind facilities	290.266	28.18	10	29.026
Geothermal facilities	18.557	1.80	2	9.278
Hydropower plants	227.532	22.09	17	13.384
Solar and photovoltaic facilities	70.489	6.84	8	8.811
Increasing energy efficiency of non-renewable energy facilities	292.202	28.36	40	7.305

Table 7
Main difficulties faced by Romanian investors during SED projects' implementation.

Difficulty	Incidence (%)	Severity	Impact		
			Time	Costs	Objectives
Delays in payments from public funds	100.00	High	Yes	No	No
Difficulties in joining the national energy system for renewable energy producers	40.45	High	Yes	Yes	No
Inappropriate scheduling of activities	71.91	Medium	Yes	Yes	Yes
Improper cost allocation across activities	56.18	Medium	No	Yes	Yes
Inadequate monitoring and evaluation techniques	52.22	Medium	Yes	Yes	Yes
Climate restrictions	20.22	High	No	No	Yes
Inefficient use of public and private funds	15.73	Medium	No	Yes	No
High fixed expenses	34.83	Low	No	Yes	No
Lack of experience on the market	26.97	Low	Yes	No	No

an effective legally framework for ensuring the connection of private renewable energy producers in the national electricity grid. Therefore, the producers run the risk of being prohibited to sell the energy they produced.

Another critical issues regarding the SED projects in Romania, emphasized by some international studies is the fact that in Eastern Europe, countries of Poland, Romania, Cyprus, the Czech Republic, and Latvia face very low effectiveness despite high potential profit opportunities [23].

Project management problems, such as inappropriate scheduling of activities, improper cost allocation across activities, inadequate monitoring and evaluation techniques, or lack of experience on the market were also announced, but they are due to internal factors, which can be kept under control on medium and long run, and solved by using effective project management tools and specialised staff, with high experience in SED projects.

5. Conclusions

As a result of our analysis, we can state some current particularities of SED projects in Romania. Romanian investors usually proved risk disinclination, which made them rather invest in developing hydropower and wind facilities, where the rate of success is expected to be higher, due to experience effect. Nevertheless, the figures outline that the most cost-effective alternative for investing in RES in Romania is represented by the solar and photovoltaic facilities, but due to higher risks, higher maintenance costs, lack of experience, and climate restrictions, investments in this type of facilities are usually avoided. Romania has also a higher potential for bioenergy investments, but this type of investment is not only avoided by the investors, but also less cost-effective than any other type of investment in RES. As Romania will most likely face no problems in reaching EU quotas for renewable energy by 2020, we also assume the existence of certain shortcomings in the incentive policy for rewarding the renewable energy producers by awarding them TGCs. Regarding the funding policy in the field of SED projects we appreciate that investments in renewable energy field (as well as in increasing energy efficiency) were significantly triggered by EU support through ERDF. Unless this support existed, we estimate that current performance in the field of renewable energy and energy efficiency could not be reached by 2020. However, the SED projects, most of them financed through Operational Sectoral Program *Increase of Economic Competitiveness*, were facing major difficulties, such as lack of efficiency in using public funds, permanent delays in public payments, slight approach of environmental protection issues, while lot of internal factors were responsible for overrun on costs, falls behind schedule, and other project management-related inconveniences.

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